

TECHNOLOGY NEEDS/OPPORTUNITIES STATEMENT OPERATIONAL MODELING FOR CDI

Identification No.: RL-DD053

Date: August 2001

Program: Decontamination and Decommissioning

OPS Office/Site: Richland Operations Office/Hanford Site

PBS No.: RL-CP01

Waste Stream: Computer Modeling

TSD Title: N/A

Waste Management Unit: N/A

Facility: Materials processing facilities (five processing canyons)

Priority Rating: This entry addresses the Accelerated Cleanup: Paths to Closure (ACPC) Priority:

- _____ 1. Critical to the success of the ACPC
- _____ 2. Provides substantial benefit to ACPC projects (e.g., moderate to high lifecycle cost savings or risk reduction, increased likelihood of compliance, increased assurance to avoid schedule delays)
- X 3. Provides opportunities for significant, but lower cost savings or risk reduction, and may reduce uncertainty in ACPC project success.

Need Title: Computerized modeling for facility planning, operation, and waste loading and tracking for the Canyon Disposition Initiative (CDI) Project.

Need/Opportunity Category: *Technology opportunity* - the user is interested in the opportunity to improve on the currently identified or planned baseline technology.

Need Description: Facility modeling for facility planning, operation, and waste loading and tracking will be necessary if the 221-U Facility is operated as a disposal facility. There is a need to virtually model the facility, contents, and proposed waste inventory to optimize facility space and loading, ensure safe disposal, and record contents.

Schedule Requirements:

Earliest Date Required: Modeling software may be needed for operations as early as March 2003.

Latest Date Required: Unknown.

Problem Description: If used for waste disposal, space in the 221-U Facility will need to be optimized. This must be done safely, and at a reasonable cost. This need relates to function number 2.0 of the CDI Feasibility Study.

Benefit to the Project Baseline of Filling Need: Meeting this need would result in the optimal waste loading and use of the facility, thereby reducing overall cost.

Functional Performance Requirements: The modeling software must incorporate all facility components including available facility resources (overhead cranes), incorporate structural loading and capacity, identify existing equipment, and track waste to be introduced into the facility for disposal. Input data will come from facility drawings, photographs, laser range finders, gamma cameras, site databases, waste inventories, and/or computer aided design (CAD) packages. The tool will be used to plan and test (simulate) waste loading methodologies to maximize the safe storage of waste in the facility, to track progress in the facility as waste is interred, and to document the inventory (identification, location, dose rate, dimension, weight, etc.) of the facility contents. Report generation is a requirement for the software so that a hard copy file may be maintained.

WBS No.
1.4.03.3.1.04.05.03.01.41.03

TIP No.
N/A

Relevant PBS Milestone: PBS-MC-030

Justification for Need:

Technical: Waste disposal space in the 221-U Facility needs to be maximized. Prior to waste delivery to the facility, task planning (simulation) will ensure that the waste is staged optimally in the facility according to the facility requirements (structural), waste type, size, contamination level, etc., prior to any equipment movement in the facility.

Regulatory: RCRA disposal site requirements.

Environmental Safety and Health: Optimized space and loading methods determined through simulations will result in reduced exposure and ensure the safe permanent disposal of waste.

Cost Savings Potential (Mortgage Reduction): Rough order of magnitude (ROM) life cycle cost (LCC) savings of \$5.5K. LCC savings estimate is based on the assumption that operational modeling would reduce the total operations and management (O&M) costs of the close in place – collapsed structure alternative by 0.1%. The close in place – collapsed structure (alternative 6) O&M costs are estimated as \$1.1M in DOE/RL-2001-29 Draft A. The optimal use of space in this facility will minimize the need for further disposal facility space in other locations.

Cultural/Stakeholder Concerns: Improved protection of the environment and of public health and safety.

Other: There are five main processing facilities on the Hanford Site, two at Idaho, and one at Savannah River. Methodologies developed for use at the 221-U Facility will be applicable at these and other similar DOE facilities.

Current Baseline Technology: Standard facility operational planning.

End-User: Waste Management Project, Environmental Restoration Project, Facility Stabilization Project

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